

CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1. (Original) A method of manipulating the temperature of a patient comprising steps of:

positioning a balloon catheter in the stomach of the patient;

exchanging heat between the balloon catheter and the stomach so as to controllably alter the temperature of a substantial portion of the patient's body.

Claim 2. (Original) The method of claim 1, wherein the step of exchanging heat between the balloon catheter and the stomach further includes introducing a heat exchange fluid into the balloon catheter.

Claim 3. (Original) The method of claim 2, further comprising maintaining the heat exchange fluid at a temperature different from normothermia.

Claim 4. (Original) The method of claim 2, further comprising maintaining the heat exchange fluid at a temperature different from normothermia for a period of time sufficient to modify the core body temperature of the patient.

Claim 5. (Original) The method of claim 2, further comprising maintaining the heat exchange fluid at a temperature above normothermia.

Claim 6. (Original) The method of claim 2, further comprising maintaining the heat exchange fluid at a temperature below normothermia.

Claim 7. (Original) The method of claim 1, wherein the step of exchanging heat between the balloon catheter and the stomach further includes introducing a liquid into the balloon catheter.

Claim 8. (Original) The method of claim 1, wherein the step of exchanging heat between the balloon catheter and the stomach further includes introducing a gas into the balloon catheter.

Claim 9. (Original) The method of claim 1, further comprising: introducing the balloon catheter through the esophagus of the patient before positioning the balloon catheter in the stomach of the patient, wherein the balloon catheter includes a catheter shaft having a diameter significantly less than the diameter of the esophagus.

Claim 10. (Original) The method of claim 1, further comprising expanding the balloon catheter in the stomach, wherein the expanded balloon catheter generally conforms with the size and shape of the stomach.

Claim 11. (Original) The method of claim 1, further comprising expanding the balloon catheter in the stomach, wherein the expanded balloon catheter distends the stomach.

Claim 12. (Original) The method of claim 1, further comprising: maintaining a predetermined target temperature for the patient that is different from normothermia.

Claim 13. (Original) The method of claim 12, further comprising: returning the patient to normothermia after the step of maintaining the predetermined target temperature for the patient.

Claim 14. (Original) The method of claim 1, further comprising:

monitoring the patient with a temperature probe to obtain a monitored temperature;

controlling the step of exchanging heat between the balloon catheter automatically based on the monitored temperature of the patient.

Claim 15. (Original) The method of claim 1, further comprising:
administering an anti-shivering mechanism to the patient during the step of exchanging
heat between the balloon catheter and the stomach.

Claim 16. (Original) The method of claim 15, wherein the step of
administering the anti-shivering mechanism includes administering a therapeutically
effective amount of an anti-shivering agent to the patient.

Claim 17. (Original) The method of claim 15, wherein the step of
administering the anti-shivering mechanism includes administering a therapeutically
effective amount of an anti-shivering agent to the patient and applying warmth to the skin
of the patient.

Claim 18. (Original) A method of manipulating the temperature of a patient
comprising steps of:

positioning a balloon catheter in the stomach of the patient,

introducing a heat exchange fluid into the balloon catheter; and

allowing the heat exchange fluid to flow through the balloon catheter in a
closed-loop, wherein heat is exchanged between the balloon catheter and the stomach so
as to controllably alter the temperature of at least a portion of the patient.

Claim 19. (Original) The method of claim 18, wherein the heat exchange
fluid flows continuously in the step of allowing the heat exchange fluid to flow through
the balloon catheter in a closed-loop.

Claim 20. (Original) The method of claim 18, maintaining the heat
exchange fluid at a temperature different from normothermia for a period of time
sufficient to modify the core body temperature of the patient.

Claim 21. (Original) The method of claim 18, further comprising maintaining the heat exchange fluid at a temperature below normothermia.

Claim 22. (Original) The method of claim 18, further comprising maintaining the heat exchange fluid at a temperature below zero degrees centigrade.

Claim 23. (Original) The method of claim 18, wherein the heat exchange fluid is a liquid.

Claim 24. (Original) The method of claim 18, wherein the heat exchange fluid is a gas.

Claim 25. (Original) The method of claim 18, further comprising maintaining the heat exchange fluid at a temperature above normothermia.

Claim 26. (Original) The method of claim 18, further comprising: introducing the balloon catheter through the esophagus of the patient before positioning the balloon catheter in the stomach of the patient, wherein the balloon catheter includes a catheter shaft having a diameter significantly less than the diameter of the esophagus.

Claim 27. (Original) The method of claim 18, wherein the step of introducing the heat exchange fluid into the balloon catheter further includes expanding the balloon catheter to generally conform with the size and shape of the stomach.

Claim 28. (Original) The method of claim 18, wherein the step of introducing the heat exchange fluid into the balloon catheter further includes expanding the balloon catheter to distend the stomach.

Claim 29. (currently amended) The method of claim ~~18~~ 19, wherein the balloon catheter is in contact with the stomach during the step of allowing the heat exchange fluid to flow continuously through the balloon catheter.

Claim 30. (Original) The method of claim 18, further comprising:
maintaining a predetermined target temperature for the patient that is different from
normothermia.

Claim 31. (Original) The method of claim 30, further comprising: returning
the patient to normothermia after the step of maintaining the predetermined target
temperature for the patient.

Claim 32. (Original) The method of claim 18, further comprising:

monitoring the patient with a temperature probe to obtain a monitored
temperature;

controlling the step of exchanging heat between the balloon catheter
automatically based on the monitored temperature of the patient.

Claim 33. (Original) The method of claim 18, further comprising:
administering an anti-shivering mechanism to the patient during the step of exchanging
heat between the balloon catheter and the stomach.

Claim 34. (Original) The method of claim 33, wherein the step of
administering the anti-shivering mechanism includes administering a therapeutically
effective amount of an anti-shivering agent to the patient.

Claim 35. (Original) The method of claim 33, wherein the step of
administering the anti-shivering mechanism includes administering a therapeutically
effective amount of an anti-shivering agent to the patient and applying warmth to the skin
of the patient.

Claim 36. (Original) A method of manipulating the temperature of a patient
comprising steps of:

introducing a balloon catheter through the esophagus of the patient, wherein the balloon catheter includes a catheter shaft having a distal end, a balloon located on the distal end of the catheter shaft, and the catheter shaft includes a first lumen in fluid communication with the balloon and a second lumen in fluid communication with the balloon;

positioning the balloon in the stomach of the patient,

expanding the balloon with a heat exchange fluid delivered through the first lumen into the balloon and out of the balloon through the second lumen, wherein heat is exchanged between the balloon and the stomach so as to controllably alter the temperature of at least a portion of the patient.

Claim 37. (Original) The method of claim 36, wherein the heat exchange fluid flows continuously in a closed-loop through the first lumen into the balloon and out of the balloon through the second lumen in the step of expanding the balloon.

Claim 38. (Original) The method of claim 36, wherein the expanded balloon generally conforms with the stomach in the step of expanding the balloon.

Claim 39. (Original) The method of claim 36, wherein the expanded balloon distends the stomach in the step of expanding the balloon.

Claim 40. (Original) The method of claim 36, maintaining the heat exchange fluid at a temperature different from normothermia for a period of time sufficient to modify the core body temperature of the patient.

Claim 41. (Original) The method of claim 36, further comprising maintaining the heat exchange fluid at a temperature below normothermia.

Claim 42. (Original) The method of claim 36, further comprising maintaining the heat exchange fluid at a temperature below zero degrees centigrade.

Claim 43. (Original) The method of claim 36, wherein the heat exchange fluid is a liquid.

Claim 44. (Original) The method of claim 36, wherein the heat exchange fluid is a gas.

Claim 45. (Original) The method of claim 36, further comprising maintaining the heat exchange fluid at a temperature above normothermia.

Claim 46. (Original) The method of claim 36, further comprising: maintaining a predetermined target temperature for the patient that is different from normothermia.

Claim 47. (Original) The method of claim 46, further comprising: returning the patient to normothermia after the step of maintaining the predetermined target temperature for the patient.

Claim 48. (Original) The method of claim 36, further comprising:
monitoring the patient with a temperature probe to obtain a monitored temperature;

controlling the step of exchanging heat between the balloon catheter automatically based on the monitored temperature of the patient.

Claim 49. (Original) The method of claim 36, further comprising: administering an anti-shivering mechanism to the patient during the step of exchanging heat between the balloon catheter and the stomach.

Claim 50. (Original) The method of claim 49, wherein the step of administering the anti-shivering mechanism includes administering a therapeutically effective amount of an anti-shivering agent to the patient.

Claim 51. (Original) The method of claim 49, wherein the step of administering the anti-shivering mechanism includes administering a therapeutically effective amount of an anti-shivering agent to the patient and applying warmth to the skin of the patient.

Claim 52. (canceled) A heat exchange apparatus comprising:

a first fluid lumen having a distal end and a second fluid lumen having a distal end;

a balloon in fluid communication with the distal end of the first fluid lumen and the distal end of the second fluid lumen, wherein a heat exchange fluid is delivered into the balloon through the first fluid lumen and the heat exchange fluid is circulated out of the balloon through the second fluid lumen;

wherein heat is exchanged between the stomach and the heat exchange fluid circulating in the balloon so as to controllably alter the temperature of at least a portion of the patient.

Claim 53. (canceled) The apparatus according to claim 52, wherein the balloon comprises a thin-walled, high strength, thermoplastic material, readily inflatable under fluid pressure and readily collapsible under vacuum.

Claim 54. (canceled) The apparatus according to claim 52, wherein the material of the balloon comprises polyethylene terephthalate.

Claim 55. (canceled) The apparatus according to claim 52, wherein the balloon is expandable to approximate the shape of the stomach.

Claim 56. (canceled) The apparatus according to claim 52, wherein the balloon comprises an elastic material.

Claim 57. (canceled) The apparatus according to claim 52, wherein the balloon is configured to generally conform with the stomach when the balloon is expanded.

Claim 58. (canceled) The apparatus according to claim 52, wherein the first fluid lumen is coaxial with the second fluid lumen.

Claim 59. (canceled) The apparatus according to claim 52, wherein the first fluid lumen is side-by-side with the second fluid lumen.

Claim 60. (canceled) The apparatus according to claim 52, wherein when the balloon is expanded by the delivered heat exchange fluid, the expanded balloon substantially conforms with the stomach.

Claim 61. (canceled) The apparatus according to claim 52, further comprising a temperature sensor located adjacent to the balloon.

Claim 62. (canceled) The apparatus according to claim 52, further comprising a thermoelectric heat exchanger connected to the first fluid lumen, wherein the thermoelectric heat exchanger controls the temperature of the heat exchange fluid flowing to the first fluid lumen.

Claim 63. (canceled) The apparatus according to claim 62, wherein the thermoelectric heat exchanger includes a temperature probe, and the thermoelectric heat exchanger is automatically controlled based on signals received from the temperature probe.

Claim 64. (New) A method of manipulating the temperature of a patient comprising steps of:

introducing a balloon catheter through the esophagus of the patient, wherein the balloon catheter includes a catheter shaft having a distal end, a balloon

located on the distal end of the catheter shaft, and the catheter shaft includes a first lumen in fluid communication with the balloon and a second lumen in fluid communication with the balloon;

positioning the balloon in the stomach of the patient;

expanding the balloon with a heat exchange fluid delivered through the first lumen into the balloon, wherein the heat exchange fluid can exit the balloon through the second lumen, and heat is exchanged between the balloon and the stomach so as to controllably alter the temperature of at least a portion of the patient;

monitoring the temperature of the heat exchange fluid delivered to the balloon;

monitoring the patient with a temperature probe to obtain a monitored temperature;

controlling the exchange heat between the balloon and the stomach automatically based on the monitored temperature of the patient.

Claim 65. (New) The method of claim 64, wherein the step of monitoring the patient further includes monitoring the temperature of a heat exchange region in the stomach.

Claim 66. (New) The method of claim 64, wherein the step of monitoring the patient further includes monitoring the temperature in the region at the patient's ear.

Claim 67. (New) The method of claim 64, wherein the step of controlling the exchange of heat between the balloon and the stomach further includes the step of controlling the temperature of the heat exchange fluid delivered to the balloon.

Claim 68. (New) The method of claim 64, wherein the step of controlling the exchange of heat between the balloon and the stomach further includes maintaining the heat exchange fluid at a temperature below normothermia.

Claim 69. (New) The method of claim 64, wherein the step of controlling the exchange of heat between the balloon and the stomach further includes maintaining the heat exchange fluid at a temperature below zero degrees centigrade.

Claim 70. (New) The method of claim 64, wherein the step of controlling the exchange of heat between the balloon and the stomach further includes controlling the speed at which the heat exchange fluid is delivered to the balloon.

Claim 71. (New) The method of claim 64, further comprising: administering an anti-shivering mechanism to the patient during the step of controlling the exchange heat between the balloon and the stomach.

Claim 72. (New) The method of claim 71, wherein the step of administering the anti-shivering mechanism includes administering a therapeutically effective amount of an anti-shivering agent to the patient and applying warmth to the skin of the patient.

Claim 73. (New) The method of claim 64, wherein the step of expanding the balloon catheter with the heat exchange fluid further includes distending the stomach with the balloon catheter.

Claim 74. (New) The method of claim 64, wherein the step of controlling the exchange heat between the balloon and the stomach automatically based on the monitored temperature of the patient further includes controllably altering the temperature of the patient to below normothermia, and returning the patient to normothermia.